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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

GRIER, LAURA A

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/044,210	<b>Applicant(s)</b> RADEMACHER ET AL.	
	<b>Examiner</b> Laura A. Grier	<b>Art Unit</b> 2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/12/01 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/27/02</u> . | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on 3/27/02 has been considered by the examiner.

### ***Drawings***

2. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 12 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for using a weighting factor alpha, does not reasonably provide enablement

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for calculation of alpha in respect to the minimizing. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

In view of the written disclosure it unclear as to what is being minimized in respect to the variables of the numerator and denominator. The specification fails to provide specific details on how alpha (m,l) is derived, except by providing the equation.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the noisy audio signal" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim 1 recites the limitation "...the current properties..." in lines 5-6. There is insufficient antecedent basis for this limitation in the claim.

Claim 1 recites the limitation "...the noisy component..." in lines 7-8. There is insufficient antecedent basis for this limitation in the claim.

Claim 2 recites the limitation "...the unrestricted filter function..." in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 2 recites the limitation "...the restriction function..." in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 2 recites the limitation "...the restricted filter function..." in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 7 recites the limitation "...the restricted filter function..." in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 8 recites the limitation "...the unrestricted filter function..." in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 9 recites the limitation "...the unrestricted filter function..., ...the restriction function..., and ... the restricted filter function.." in lines 4-5. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 12, the claim language is indefinite as to what is being minimized in the respect to the variables being used in the equation.

Claims 3-6, and 10-14 depend from claim 1 and thus are rejected accordingly.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art in view of Deller, Proakis, and Hansen (here, Deller combination.

Regarding claim 1, the applicant's admitted prior art (herein, AAPA) discloses reducing random, continuous, non-stationary noise in audio signals by sampling and using a filter with a

filter function (pages 2-6 and figures 1-2). However, the filter function fails to be disclosed with dynamic functioning capabilities as claimed.

Regarding the dynamic function of the filter function, Deller combination discloses a iterative Wiener filtering (page 517-520), which indicates a filter with dynamic process for updating a filter.

It would have been obvious to one of the ordinary skill in the art at the time the invention was made to modify the invention of AAPA by applying a Wiener filter process and function of the purpose of adapting filter characteristics on a frame-by-frame basis based on the noise level compared to the signal as taught by Deller.

Regarding claims 2-4, AAPA and Deller combination discloses everything claimed as applied above (see claim 1). AAPA discloses an estimated of the noise component, a unrestricted filter function, and a restriction function and filter function, wherein,  $m$  denotes the discrete frequency and  $l$  represents the discrete time. However, the filter function is disclosed as claimed. Deller combination discloses a iterative Wiener filtering (page 517-520), which indicates a filter with dynamic process for updating a filter, which provide modification for deriving the filter function  $H_b$  enabling frame-to-frame adaptation based on the noise level compared to the signal, wherein  $\gamma$  needs to be function of time because the noise changes with time.

Regarding claim 5, AAPA and Deller combination discloses everything claimed as applied above (see claim 1). Noise determines the audibility of a signal. Thus, it would have been obvious to implement a one method step for deriving a restricted filter function if the specific signal level and noise level are known to derive  $\gamma$ .

Regarding claim 6, AAPA and Deller combination discloses everything claimed as applied above (see claim 1). AAPA discloses filtering the noisy audio signal in a frequency domain.

Regarding claim 7, AAPA and Deller combination discloses everything claimed as applied above (see claim 1). AAPA discloses capability of the Wiener filter performing in respect to the quadratic error between the signal and the estimate being used as the approximation criterion.

Regarding claim 8, AAPA and Deller combination discloses in accordance with Wiener, the filter function can be determined in accordance with amplitude subtraction.

Regarding claim 9, AAPA and Deller combination discloses everything claimed as applied above (see claim 1). AAPA discloses an estimated of the noise component, a unrestricted filter function, and a restriction function and filter function, wherein,  $m$  denotes the discrete frequency and  $l$  represents the discrete time. AAPA further discloses the noise reduction obtained by filtering and after filtering, the reduced noise signal is transferred back to the time domain. However, the filter function is disclosed as claimed. Deller combination discloses a iterative Wiener filtering (page 517-520), which indicates a filter with dynamic process for updating a filter, which provide modification for deriving the filter function  $H_b$  enabling frame-to-frame adaptation based on the noise level compared to the signal, wherein  $\gamma$  needs to be function of time because the noise changes with time.

Regarding claim 10, AAPA and Deller combination discloses everything claimed as applied above (see claim 1). AAPA discloses the estimate being a function of noise power

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density, thus, it would be obvious that the dynamically limited filter function uses the an estimated instantaneous of noise power density through the modification of the Wiener filtering process taught by Deller combination.

Regarding claims 15-16, AAPA discloses in figure 2 devices for producing an unrestricted filter function (3), producing a time-dependent function (6) – Pages 2-6. However, AAPA fails to disclose the device for producing a restricted filter function and filtering the noisy signal.

Deller combination discloses an iterative Wiener filtering (page 517-520), which indicates a filter with dynamic process for updating a filter.

It would have been obvious to one of the ordinary skill in the art at the time the invention was made to modify the invention of AAPA by applying a Wiener filter process and function of the purpose of adapting filter characteristics on a frame-by-frame basis based on the noise level compared to the signal as taught by Deller.

Regarding claim 10, AAPA and Deller combination discloses everything claimed as applied above (see claim 1). However, AAPA and Deller combination fail to discloses determining the estimated of the auto noise power density as claimed. A noise spectrum estimate varies in time and over frequency, Thus, it would have been obvious to express the noise estimate of the noise power density in that form.

***Allowable Subject Matter***



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9. Claims 13-14 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura A. Grier whose telephone number is (571) 272-7518. The examiner can normally be reached on Monday - Friday, 7:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh N. Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Laura A. Grier  
June 7, 2005